

## **REMARKS**

Claims 1-30 remain in the application. Independent claims 1-4, 7-8, 13-18, 20, 22-30 have been amended for clarity. Support for these amendments can be found in the Detailed Description section of the current application at page 6, paragraph 22. No new matter has been included with these amendments. New claims 31-32 have been added.

### **A. 35 U.S.C. § 112**

Claims 2-4 stand rejected under 35 U.S.C 112, first paragraph, as not enabling the formation of a passivation layer using other than oxygen gas. As will be appreciated by the Office “the test for enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.” *In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988). It is well known by those skilled in the art that many gases such as inert gases (e.g., argon etc.), hydrogen, fluorine containing gases forming gases, nitrogen gas, as well as liquids including acids, bases solvents and de-ionized water may passivate a surface by physical and/or chemical means, as described at paragraph 27 of the present invention. Those means may include adsorption of species onto the surface, passivation of dangling bonds on the surface etc. as are well known to those skilled in the art. Hence, it is respectfully submitted that identifying the alternative gases in the claims, along with the specification description and discussion of using oxygen gas, enables one skilled in the art to perform the recited embodiments without undue experimentation.

If the Office remains unconvinced, the Office is respectfully reminded that it has the initial burden to establish a reasonable basis to question the enablement provided for the claimed

invention. *In re Wright*, 999 F.2d 1557, 1562 27 USPQ2d 1510, 1513 (Fed Cir. 1993)(see also MPEP § 2164.04). It is incumbent upon the Patent Office, whenever a rejection on this basis is made, to explain why it doubts the truth or accuracy of any statement in a supporting disclosure and to back up assertions of its own with acceptable evidence or reasoning which is inconsistent with the contested statement. Otherwise, there would be no need for the applicant to go to the trouble and expense of supporting his presumptively accurate disclosure. *In re Marzocchi*, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971)(see also MPEP § 2164.04). In the present Office action, the Office has done little more than to question the enablement of the disclosure. The Office has failed to meet its burden of establishing a lack of enablement by providing evidence and/or reasoning as to why the listed liquids and gases would not work as recited. Therefore, since it is known to those skilled in the art, without undue experimentation, how to make and use the recited embodiments of the invention from the disclosure, and since the Office has not met its burden as to establishing a reasonable basis to question the enablement of the present invention, the Applicants respectfully request withdrawal of the section 112 rejection regarding enablement of claims 2-4.

Claims 1-27 and 30 stand rejected under 35 U.S.C. 112 as being indefinite (Office Action, page 4). With regard to claim 1-21, the Office maintains that the step of providing a substrate structure into a chamber of a first tool and the remaining steps is unclear, and that as claimed, the various layers can be formed outside or inside the chamber/tool. Claim 1 has been amended for clarity to provide that the passivation layer is formed within the processing tool. Claims 22 and 28 have been amended for clarity to provide that the metal seed layer and the passivation layer are formed substantially sequentially in the same processing tool. Thus,

reconsideration and withdrawal of the Section 112 rejection of claims 1-21 is respectfully requested.

Claims 2-4 have stand rejected as being indefinite. Claims 2-4 have been amended for clarity. Thus, reconsideration and withdrawal of the Section 112 rejection of claims 2-4 is respectfully requested.

Claim 8-12 have been rejected under section 112 for being indefinite Claim 8 has been amended for clarity. Thus, reconsideration and withdrawal of the Section 112 rejection of claim 8, and claims 9-12 which depend from claim 8, is respectfully requested.

Claims 15-18 stands rejected for insufficient antecedent basis. Claim 8 has been amended to overcome the rejection. Thus, reconsideration and withdrawal of the Section 112 rejection of claims 15-18 is respectfully requested.

Claim 20-21 and 22-27 have been rejected for indefiniteness because the purpose of the electroplating is unclear. The electroplating tool is capable of performing electroless plating (see paragraph 36 of the Detailed Description section of the present invention). Thus, reconsideration and withdrawal of the Section 112 rejection of claims 20-21 and 22-27 is respectfully requested.

Claim 23, 25-27 have been rejected for indefiniteness. Claims 23-27 have been amended for clarity. Thus, reconsideration and withdrawal of the Section 112 rejection of claims 23, 25-27 is respectfully requested.

Claim 30 has been rejected for indefiniteness. Claim 30 has been amended for clarity. Thus, reconsideration and withdrawal of the Section 112 rejection of claim 30 is respectfully requested.

B. 35 U.S.C. § 102(e)

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Liu- Claims 1, 2, 5-7, 13, 14, 20-22, 28 and 30

Claims 1, 2, 5-7, 13, 14, 20-22, 28 and 30 stand rejected under 35 U.S.C. § 102(e) as being anticipated by the U.S. Patent No. 6,395,642 issued May 28, 2002 to Liu, et al. (hereinafter “Liu”) (Office Action, page 6). With regard to independent claims 1, 22 and 28, claims 1, 22 and 28 have been amended for clarity to describe forming a passivation layer over the metal seed layer while in the processing tool. The support for these amendment can be found in the Detailed Description section of the current application at, for example, page 6, paragraph 22.

The Office relies on Liu for a teaching of the seed layer being oxidized to form a copper oxide in the manufacturing line (outside of the processing tool)(col. 5, line 67 to col. 6, lines 1-2). However, Liu does not disclose or even suggest the limitation of a passivation layer being formed over the seed layer while in the processing tool, as recited in the amended claims 1, 22 and 28. Therefore, since Liu does not teach or disclose all of the limitations of independent claims 1, 22 and 28, and since dependent claims 2, 5-7, 13, 14, 20-21, and 30 depend from claims 1 and 28 respectively, it is respectfully submitted that claims 1, 2, 5-7, 13, 14, 20-22, 28 and 30 are not anticipated by Liu. Because the dependent claims are allowable for at least the reason of depending from allowable base claims, Applicants are not addressing further the

rejections of the dependent claims at this time. Thus, reconsideration and withdrawal of the Section 102(e) rejection of claims 1, 2, 5-7, 13, 14, 20-22, 28 and 30 are respectfully requested.

Hymes- Claims 1-7, 13, 20 and 21

Claims 1-7, 13, 20 and 21 stand rejected under 35 U.S.C. § 102(e) as being anticipated by the U.S. Patent No. 6,423,200 issued July 23, 2002 to Hymes, et al. (hereinafter “Hymes”) (Office Action, page 8). With regard to independent claim 1, claim 1 has been amended, as described above, to describe forming a passivation layer over the metal seed layer while in the processing tool. The Office relies on Hymes for a teaching of the wafer being exposed to oxygen to form a metal oxide layer. (Office Action, page 8). However, among other things, Hymes does not disclose the limitation of a passivation layer being formed over the seed layer while in the processing tool, as recited in the amended claim 1. Rather, Hymes teaches the wafer being exposed to oxygen upon removal from the chamber (col. 7, lines 52-57). Therefore, Hymes does not teach or disclose all of the limitations of independent claim 1, and Applicants respectfully request withdrawal of this rejection Regarding the rejections of dependent claims 2-7, 13, 20 and 21, since these claims are allowable for at least the reason as depending from an allowable base claim, Applicants will not address further the rejections of the dependent claims at this time. Thus, reconsideration and withdrawal of the Section 102(e) rejection of claims 1-7, 13, 20 and 21 is respectfully requested.

C. 35 U.S.C. § 103(a)

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one

of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Liu in view of Nogami- Claims 15, 17, 19, 24 and 26

Claims 4, 6, 12, 17-19, 21 and 23-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of the U.S. patent No. 6,242,349 issued to Nogami et. al. (hereinafter "Nogami")(Office Action, page 9). The Office contends that it would have been obvious to modify Liu to use the claimed operating parameters as taught by Nogami (Office Action at page 10).

However, "to establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." In *re Royka*, 490 F.2d 981,180 USPQ 580 (CCPA 1974). With respect to claims 15, 17, 19, and 24, 26, these claims respectively depend from claims 1 and 22, which contain the limitation that the passivation layer is formed within the processing tool. Neither Liu alone or in combination with Nogami teach or suggest the limitation of the passivation layer being formed within the processing tool. Therefore, even if we assume for the sake of argument that it is generally true that process variables such as anneal time, temperature and gas composition may be optimized, the examiner has failed to establish a prima fascia case of obviousness here. Thus, reconsideration and withdrawal of the Section 103(a) rejection of claims 15, 17, 19, and 24, 26, is respectfully requested.

Liu in view of Nogami and further in view of Acuthan- Claims 16 and 18

Claims 16 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Nogami, and further in view of the U.S. Patent No. 6,498,397 issued December 24, 2002 to Acuthan, et. al., (hereinafter “Acuthan”) (Office Action, page 11). The Office contends that it would have been obvious to modify Liu and Nogami to use the step of rapid cooling as taught by Acuthan.

However, “to establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” In *re Royka*, 490 F.2d 981,180 USPQ 580 (CCPA 1974). With respect to claims 16 and 18, amended independent claim 1 contains the limitation that the passivation layer is formed within the processing tool. Acuthan, neither alone nor in combination with Liu/Nogami teaches or suggests the limitation of the passivation layer being formed within the processing tool. Therefore, even if we assume for the sake of argument that it is generally true that process operating conditions with respect to anneal time, cooling time etc. might be obvious to one skilled in the art, the examiner has failed to establish a prima fascia case of obviousness here. Thus, reconsideration and withdrawal of the Section 103(a) rejection of claims 16 and 18 is respectfully requested.

Liu in view of Nogami and further in view of Cohen- Claims 23 and 29

Claims 23 and 29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Nogami, and further in view of the U.S. Patent No. 6,027,630 issued February 22, 2000 to Cohen, et. al., (hereinafter “Cohen”) (Office Action, page 12). The Office contends that it would have been obvious to modify Liu to anneal and deposit under vacuum conditions as taught by Nogami and Cohen.

However, “to establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” In *re Royka*, 490 F.2d 981,180 USPQ 580 (CCPA 1974). With respect to claims 23 and 29, amended independent claims 22 and 28, from which claims 22 and 29 depend respectively, contain the limitation that the passivation layer is formed within the processing tool. Cohen, neither alone nor in combination with Liu/Nogami teaches or suggests the limitation of the passivation layer being formed within the processing tool. Therefore, even if we assume for the sake of argument that it is generally true that annealing and processing under vacuum conditions improves uniformity, the examiner has failed to establish a prima facie case of obviousness here. Thus, reconsideration and withdrawal of the Section 103(a) rejection of claims 23 and 29 is respectfully requested.

Liu in view of Acuthan- Claims 25 and 27

Claims 25 and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Acuthan. The Office contends that it would have been obvious to modify Liu and to use the step of rapid cooling as taught by Acuthan.

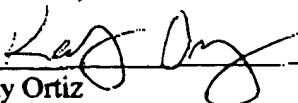
However, “to establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” In *re Royka*, 490 F.2d 981,180 USPQ 580 (CCPA 1974). With respect to claims 25 and 27, amended independent claim 22, from which claims 25 and 27 depend, contains the limitation that the passivation layer is formed within the processing tool. Acuthan, either alone or in combination with Liu, fails to teach or suggest the limitation of the passivation layer being formed within the processing tool. Therefore, even if we assume for the sake of argument that it is generally true that rapid cooling provides greater adhesion and that exact operating conditions are dependent upon properties of the



substrate, the examiner has failed to establish a prima facie case of obviousness here. Thus, reconsideration and withdrawal of the Section 103(a) rejection of claims 25 and 27 is respectfully requested.

In view of the foregoing remarks, the Applicants request allowance of the application. Please forward further communications to the address of record. If the Examiner needs to contact the below-signed agent to further the prosecution of the application, the contact number is (503) 264-0944.

Respectfully submitted,



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